

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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EDITORIAL COMMENT.



TAKing it all round, the year that has just come to a close can, we think, be said to have been a fairly satisfactory one for aviation. If there has been no startlingly new development it can, on the other hand, be said that there have been no serious setbacks to slow and steady improvement. From the general average level, certain events protrude which mark innovations or improvements that may or may not in all cases fulfil their first promises, but which do, at any rate, serve to show that as yet there is no imminent risk of stagnation.

It is quite unnecessary, neither is it proposed, to recapitulate here all the events of 1925. But certain happenings which appear to have a bearing on the future may with advantage be briefly referred to, in order that we may start the new year with a clearer conception of what has been accomplished in 1925, and thus gain a better appreciation of that which still remains to be done.

Dealing first with what is, after all, the largest and most important phase of British aviation, the Royal Air Force and its ancillary services, the year has shown a steady increase in the size and functions of our air forces. The Royal Air Force itself has been increased, and the work of planning and organising the Special Reserve and the Auxiliary Air Force has progressed somewhat, if not quite at the rate some could have wished. The equipment of R.A.F. squadrons with new machines has gone on, and there is now a gratifying decrease in the number of war-time types in use. At the same time, it would be futile to claim that all the R.A.F. squadrons are by now mounted on machines worthy of our air service, and one of our New Year resolutions must be the complete scrapping of obsolete and obsolescent types. Fortunately, signs are not wanting that the Air Ministry realises the importance of this, and intends, in so far as it lies in its power, to continue and to extend the policy of re-equipment commenced during 1925. The Home Defence scheme, making use of a fairly large percentage of civilian personnel, has been put into operation and

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1926		
Jan. 7	Prof. A. J. Sutton Pippard. "The Experimental Stress Analysis of Frameworks," before R.Ae.S.	
Jan. 9	Aero Club of Belgium 25th Anniversary Banquet.	
Jan. 11	F.A.I. Conference, Paris.	
Jan. 12	Mr. C. Howarth. "Some Aspects of Full-Scale Experiments," before Inst.Ae.E.	
Jan. 13	London Aeroplane Club Inaugural Dance, Suffolk Galleries, Suffolk Street, W. 1.	
Jan. 21	Maj. J. S. Buchanan. "The Schneider Cup Race, 1925," before R.Ae.S.	
Jan. 26	Lieut. Olechnovitch. "The Care and Maintenance of Tools as an Important Factor in Workshop Routine," before Inst.Ae.E.	
Feb. 4	Joint Meeting of R.Ae.S. and Inst.Ae.E. at R. Soc. of Arts. Mr. L. C. Lawrence, "American Aircraft Engine Development."	
Feb. 9	Informal Meeting, Inst.Ae.E.	

a small start has been made, and it may confidently be expected that during 1926 the organisation of this branch of our air activities will progress in real earnest. At the same time it should not be forgotten that with the subject of disarmament to be raised once again, many things may happen, and for this reason too great expectations from the year to come should not be entertained.

As regards the aircraft industry, whose very life and existence is naturally closely bound up with the Royal Air Force, the year has been in the main a successful one from a business point of view. If few firms have been swamped with orders, the majority has at any rate, been able to obtain sufficient to enable a certain amount of experimental work to be carried out, thereby preparing for the future, and it is gratifying to be able to record that we finish the year with the same number of aircraft construction firms in existence with which we commenced the year. That a few of them have had a somewhat lean time cannot be denied, but generally speaking the industry has probably made a little headway. From a technical point of view, very good progress has been made, and during the year many firms have done very excellent work in the development of new forms of construction. This applies particularly, of course, to the subject of metal construction, many interesting forms of which have been evolved by various firms. Fortunately, there are signs that the restrictions hitherto placed by the Air Ministry upon certain forms of metal construction are about to be, and in some cases have been, relaxed, and this can scarcely fail to have a beneficial effect upon future development. The two outstanding examples of this are the use of welded steel tube construction and the construction of machines, and more particularly of metal hulls for flying-boats, in Duralumin. Both have, so far as our experience has gone, proved successful, and from this point of view the year 1925 may well mark the beginning of an important advance. At the same time, steel construction has continued, not only in the form known for several years, such as the use of rolled or drawn sections of thin gauge, but also in novel methods of using less high-grade materials. The announcement, recently made, that in two years' time all-metal construction will be compulsory, will probably result in the evolution of yet different forms of construction, and in some of the types of construction which are at present experimental becoming accepted as normal. In this connection it is important that the Air Ministry keep an open mind, since much will depend upon the freedom afforded individual designers in attacking the numerous and difficult problems attending the evolution of new methods of metal construction.

Of real innovations, as far as Great Britain is concerned, mention must be made of the Cierva "Autogiro," the invention of a Spanish engineer. The idea does not, strictly speaking, belong to 1925, but it is not until this year that anything much has become known about it. What influence the "windmill" wings may have on future development is not yet possible to say.

As regards aero engines, the year has been marked by a considerable improvement in existing types of engines, all of which can now be said to have reached a stage of development where they are extremely satisfactory. In the matter of service engines, perhaps the most outstanding feature has been the development and perfectioning of the radial air-cooled engine. This British type has now reached a position

of prominence, and as yet there is no saying what the ultimate function of this type may be. Among the British water-cooled engines, of the types in regular use in the R.A.F., progress has, perhaps, been somewhat less rapid, but this is chiefly due to the fact that the water-cooled type had already been intensively developed, and that thus the scope for further improvement was smaller. It is known that new types are coming along which, it is believed, will demonstrate their merits during 1926. A milestone in aero engines for racing purposes was the production of the Napier engine used in the Schneider Cup racers, which showed a perfectly amazing power-weight ratio, and thus proved that the internal-combustion engine, even of fairly orthodox design, has by no means yet reached the limits of its possibilities.

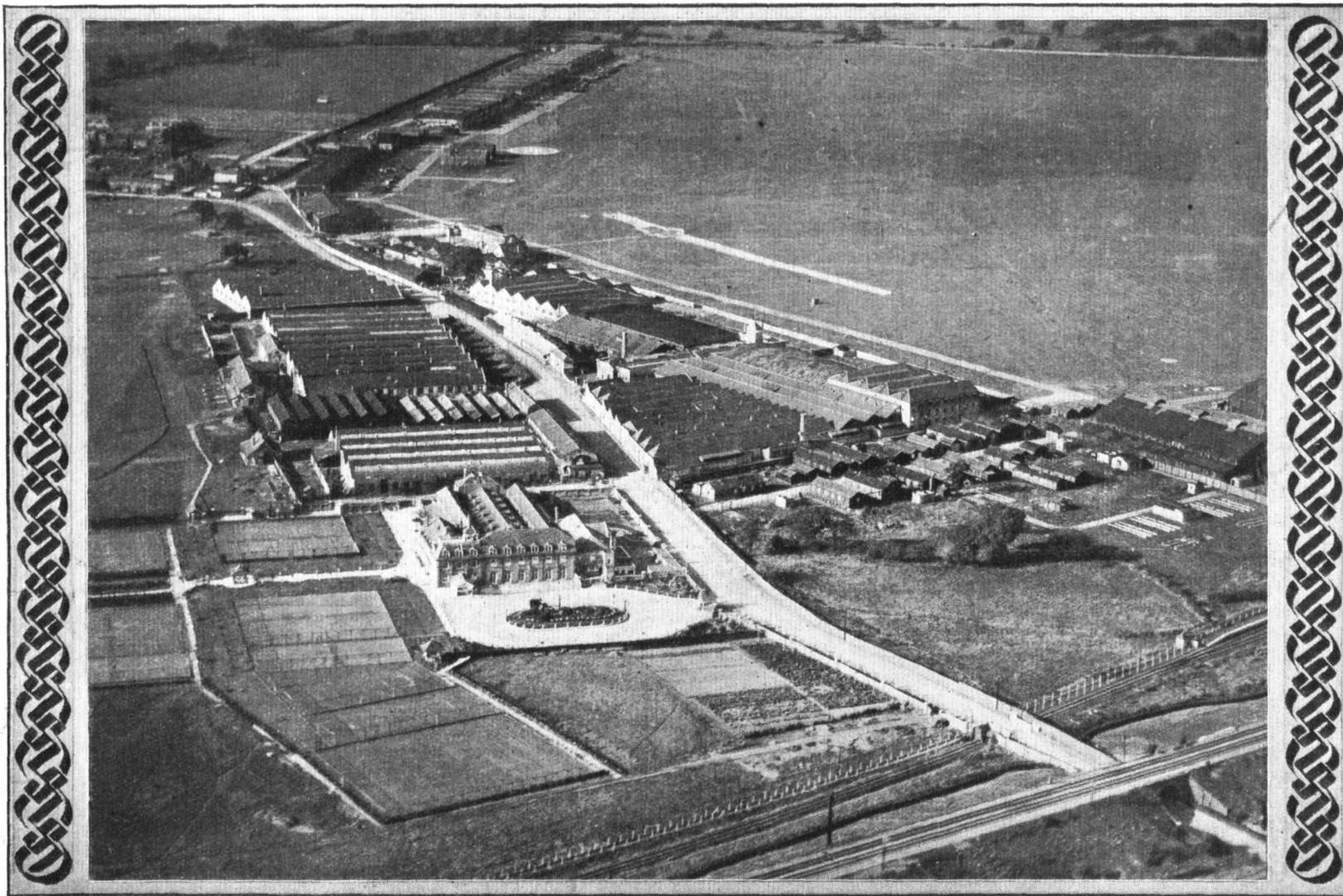
On the subject of civil aviation much could be written, but it will suffice if we recall that the main event of 1925 in this respect was the formation of the light 'plane clubs and their inauguration somewhat late in the year. Already these clubs have done excellent work, and if the official support to them is continued next year there can be little doubt that the summer months of 1926 will see a considerable increase in flying by private pilots.

Commercial aviation has not, it is to be feared, had a particularly good year. Imperial Airways, Ltd., a résumé of whose first annual report is published in this issue, have not been able to extend their lines, nor have anything like as many improved types of machines been ordered, or at any rate put into service, as should have been the case. For next year, however, several new types are promised, and it is thus to be hoped that the coming year will see the turning point, and that from now onwards progress will be more rapid than it was in the past. The handing over to Imperial Airways of the Cairo-Baghdad desert route will probably not make itself felt to any great extent, even during 1926, as it seems doubtful whether the service will be inaugurated during the coming year.

Turning to the question of sporting aviation, 1925 will not stand out prominently as far as British sporting aviation is concerned. But two races were held during the year, the race for the King's Cup, and the August light 'plane races at Lympne. The only other event of note, the Schneider Cup seaplane Race at Baltimore, was not a success as far as the British challengers are concerned, but it is at any rate something to remember 1925 by, that we were able to send challengers across, even if they were not successful. At the moment it is uncertain whether or not another opportunity will occur in 1926.

Of long-distance flights during the year there have been a considerable number, partly by British pilots on British machines and partly by foreign machines using British engines, and in which therefore Great Britain can justly claim its share. The value of these flights is very great, probably much greater than is generally realised, and the fact that there has been a resumption of such flights is something to be placed on the credit side of the ledger for 1925.

Finally we come to the question of world's records. For a few short weeks one of these actually stood to the credit of Great Britain, *i.e.*, the seaplane speed record established by Capt. Biard on the Supermarine-Napier S.4. This record was not, however, permitted to stand for long, and was beaten by a large margin by an American machine. At the moment *not a single world's record stands to the credit of Great Britain.*



Copyright Aerial Photograph by Aerofilms Ltd., the London Aerodrome, Hendon

FOR HOME DEFENCE: The London Aerodrome, Hendon, which the Government has recently purchased from Mr. Claude Grahame-White, will be turned into one of the Air Defence Air Stations which are being established in various parts of the country. Thus the aerodrome associated with the early history of flying in Great Britain will be retained permanently as an aerodrome, although its character will be somewhat different.

A NEW BRITISH AEROPLANE FOR LATVIA

The Beardmore W.B. XXVI, With Rolls-Royce "Eagle IX" Engine

IN our issue of August 20, 1925, we published a description, and the general arrangement drawings, of the first service machine to be designed by Mr. W. S. Shackleton upon joining Wm. Beardmore's Aviation Department. This machine, known as the type W.B. XXVI, was finished some time ago, and has passed all its flying tests, during which the machine came up to the calculated performance figures.

owing to the low unit pressure, low rubbing velocity and the relatively short period during which the blocks are working, should last practically for ever. It is not possible to give a detailed description of the arrangement at the moment, but when patent considerations allow of doing so we hope to be able to describe this interesting undercarriage in detail. In the meantime it may be stated that the W.B. XXVI during

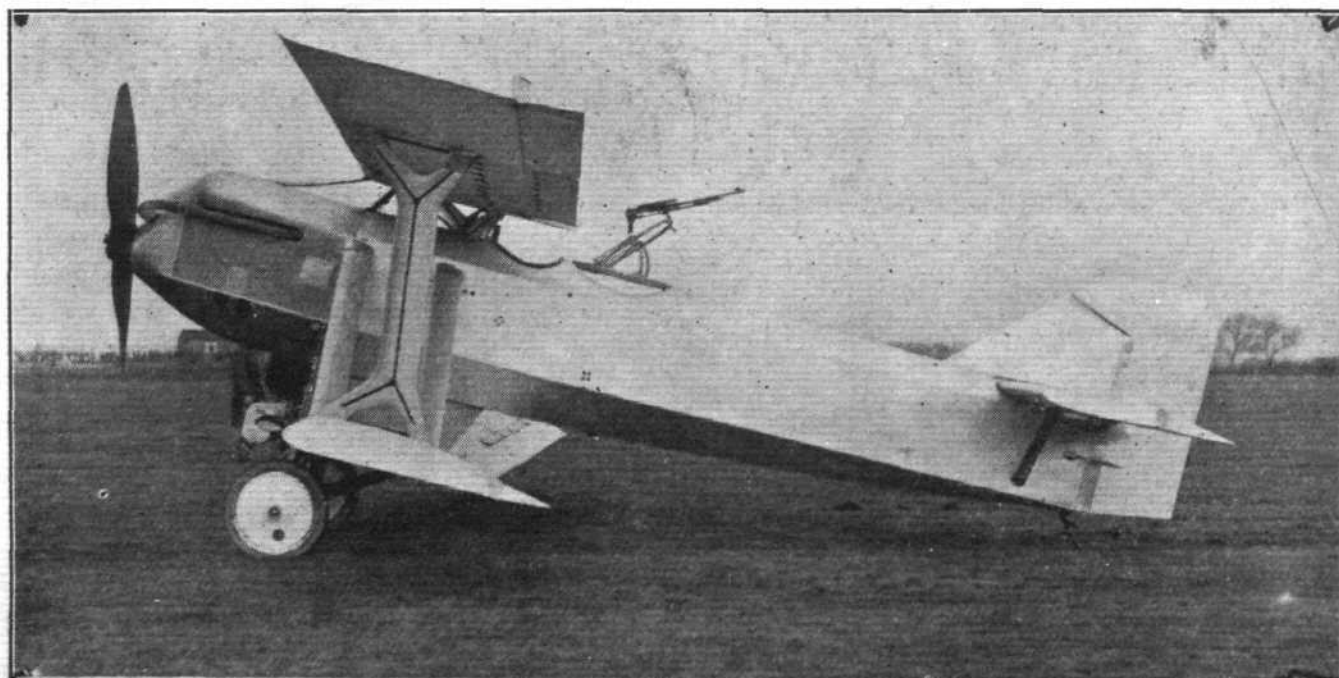


NEW BRITISH AEROPLANE FOR LATVIA: The Beardmore W.B. XXVI is a two-seater fighter with Rolls-Royce "Eagle IX" engine. This three-quarter front view shows the unusual wing bracing and the special undercarriage "leg," which gives a travel of no less than 11 in.

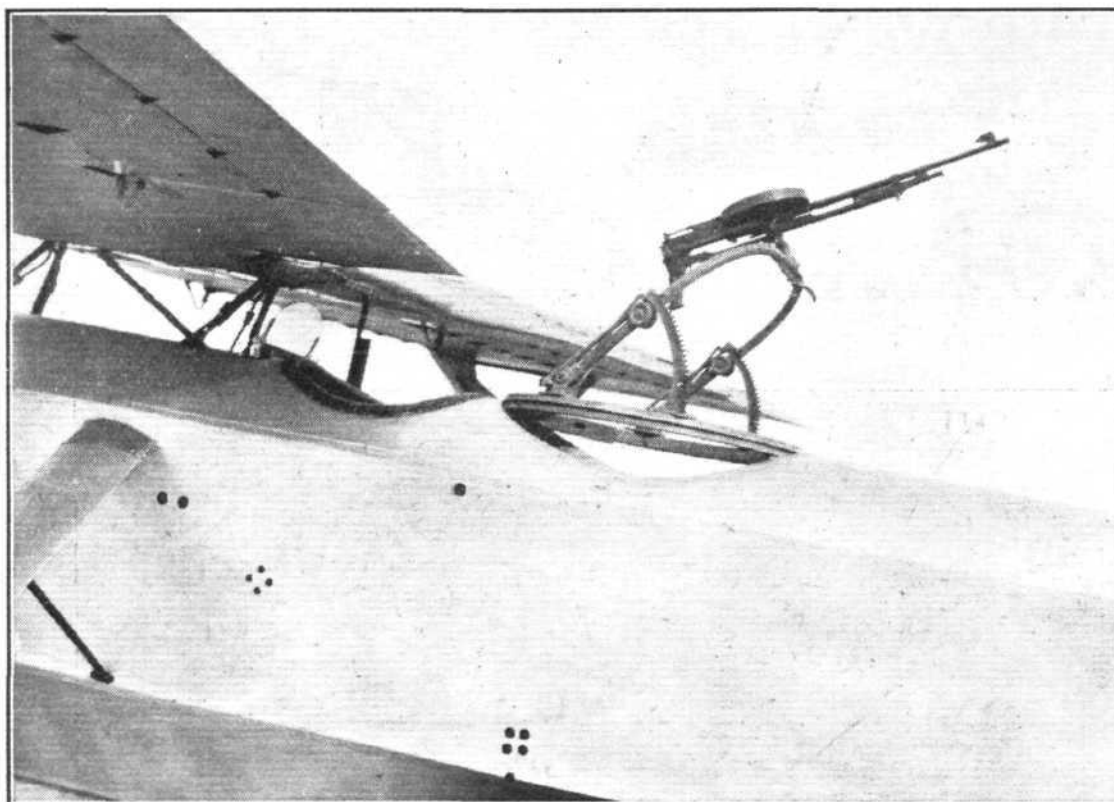
The manoeuvrability is said to be very good indeed, and the machine handles exceptionally well on the ground, chiefly on account of the special patented telescopic undercarriage "legs," which have an unusually long travel, and which incorporate, in addition, a novel system of springing in which the load is taken by coil springs while bouncing is checked by a special arrangement of Ferodo friction blocks, which,

tests has been repeatedly taxied at speeds of over 50 m.p.h. across very rough ground, a treatment which both undercarriage and machine withstood without giving any trouble whatever.

Incidentally, it may now be mentioned that the W.B. XXVI has been ordered by the Latvian Government, and it is somewhat by way of a compliment to Mr. Shackleton's skill as



THE BEARDMORE W.B. XXVI: Side View.



The machine gun
and its Scarff
ring mounting on
the Beardmore
W.B. XXVI.

a designer that the machine was actually ordered on the strength of the general lay-out and estimated performances, while still in the design stage. It is not often that a customer is prepared to buy a machine which is still only "on paper," even if it is made a stipulation of the order that certain specified performances have to be attained. In the case of the W.B. XXVI the performances promised were not only attained but actually, we believe, exceeded in every instance.

As regards the machine itself, as we have already given a general description it will only be necessary to give here the briefest outline of the main features. The W.B. XXVI is, as already stated, a two-seater fighter fitted with Rolls-Royce "Eagle IX" engine. Both in its aerodynamic and constructional features, particularly the latter, noted departures from normal practice are to be found. Thus the wing bracing is unorthodox in that the usual wire bracing has been replaced by rigid strut bracing, the lower plane being braced on each side by two struts in compression, lift loads from the top plane being transmitted by single I-struts in tension. The wing-section used is a thick one, which has been found by Mr. Shackleton to give very good efficiency combined with a high k_x max.

The ply-wood covered fuselage is placed high in the gap

between the planes, the lower wings being attached to a fin built integral with the fuselage.

Great attention has been given to simplicity in service, and the use everywhere of rigid bracing should greatly facilitate maintenance work in the field, as there are no wires to stretch and necessitate trueing up.

The general design of the Beardmore W.B. XXVI has been planned with the object of giving a good view and field of fire, and the accompanying photographs seem to indicate that this object has been achieved. The pilot is provided with two machine guns housed inside the fuselage, while the gunner, placed close behind the pilot, is able to fire straight down, forward between the wings, upward over the top plane, and aft past a tail without bracing on top.

The general dimensions of the W.B. XXVI are: Length o.a., 27 ft. 10½ in.; span, 37 ft.; wing area, 356 ft. sq. The weight of the machine empty is 2,555 lb., useful load, 1,425 lb. Total loaded weight, 3,980 lb. Weight per h.p., 10 lb. Weight per sq. ft., 11.18 lb.

If desired, the machine can be obtained fitted with the Napier "Lion" engine, and it is claimed that this version will have a performance equal to that of any similar type at present constructed in any country.

London-Dublin Flight in a "Moth"

ONCE again have the excellent qualities of the D.H. "Moth" light plane (60 h.p. A.D.C. "Cirrus" engine) been demonstrated by a remarkable flight from London to Dublin. It had previously been arranged that Col. the Master of Sempill should have left London for Ireland in a D.H. "Moth," carrying Sir Sefton Brancker as passenger, just before Christmas—Sir Sefton having arranged to visit the Free State for the purpose of studying the possibilities of passenger and mail air services, and other aeronautical problems connected with Ireland. Bad weather, unfortunately, prevented him from carrying out the flight as originally planned, and he proceeded to Ireland by the usual land and sea route. On December 23, however, the Master of Sempill left Stag Lane aerodrome in the "Moth" at 10.10 a.m., in spite of the fact that a strong head wind prevailed, and with only one stop *en route* covered the 300 or so miles to Dublin in 4 hr. 45 min. The most remarkable feature of this flight consisted of the fact that instead of flying *via* Stranraer and Belfast, which involved a sea crossing of only 25 miles, as originally planned, the Master of Sempill flew the direct route to Dublin *via* Holyhead, entailing a sea crossing of 70 miles! We understand that during their stay in Ireland Sir Sefton and the Master of Sempill will visit various Free State aerodromes in the "Moth," and will finally fly back to England. Sir Sefton stated that he thought there were great possibilities as regards air

services in and to and from Ireland, both for passengers and mails. It may be of interest to note that the Free State Air Force is planning a flight to America during the coming year. Whether they intend to use a D.H. "Moth" or not, we do not know!

London-Cape Town Survey Flight

HAVING spent the night of December 21 at Atbara (Sudan) Mr. Alan Cobham and his companions, Mr. Elliott and Mr. Emmott, continued on their way to Cape Town in the D.H. 50J (Siddley "Jaguar") the following morning. After a pleasant and uneventful flight lasting an hour and a half, they landed at Khartoum. Here they stayed over Christmas, Mr. Cobham again having a busy time attending to matters relating to future air service possibilities. He says that he is convinced that the route from Cairo to Khartoum offers splendid opportunities for an air service and forms what he considers to be the most ideal airway in the world. The journey was resumed on December 28, the next stage being one of 430 miles to Melakal.

Helium in Canada

It is reported that Prof. J. C. McLennan, of Toronto University, has located helium wells at Inglewood in the Peel Country, not far from Toronto. Their yield is estimated at 100,000 cub. ft. per year. It is expected that the National Research Council of Canada will establish a helium extraction plant at Inglewood.

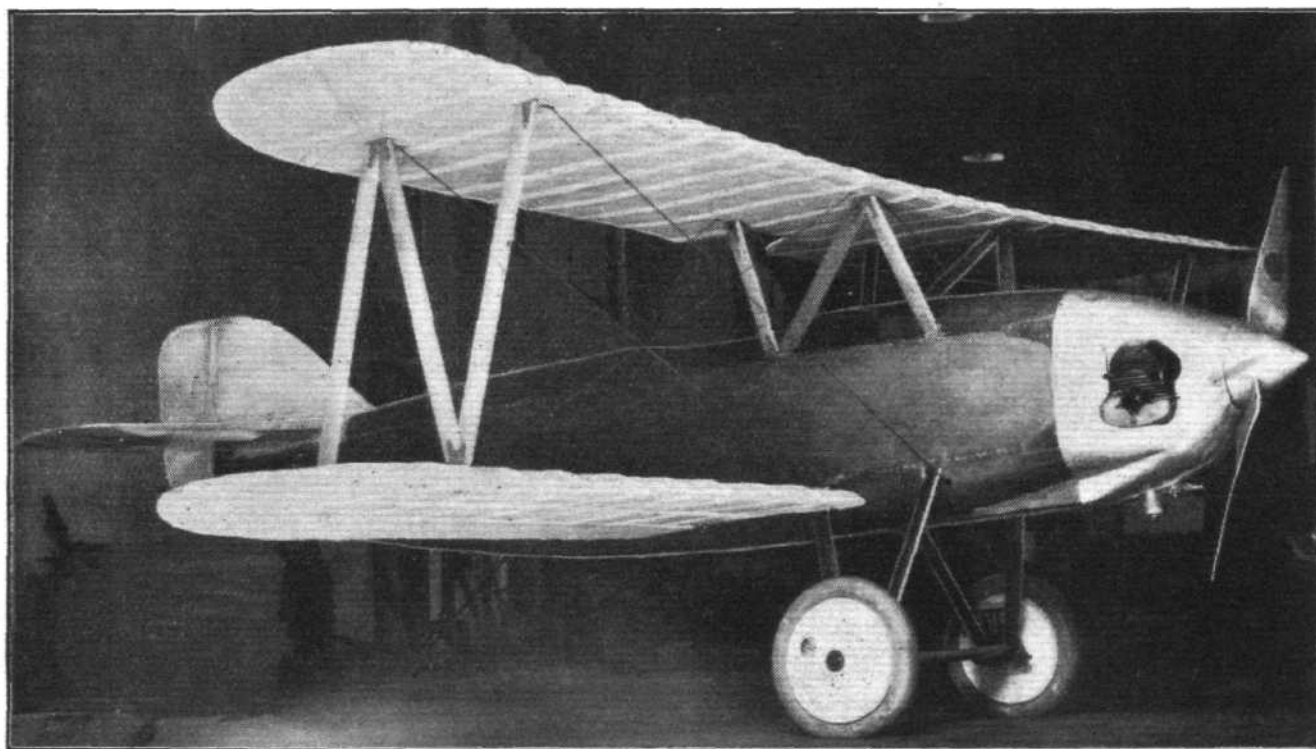
THE POWELL LIGHT 'PLANE

A Successful American Machine with Bristol "Cherub" Engine

As already recorded in *FLIGHT*, the machine which won all the prizes in its class at the New York air races this autumn was the Powell light biplane, fitted with the Bristol "Cherub" engine. This machine won the *Aero Digest* Trophy, the *Scientific American* Trophy, and the *Dayton Daily News* Trophy, as well as prize money totalling \$2,000. The machine was designed, and to a large extent built, by Prof. C. H. Powell, Professor of Aeronautics at the University of Detroit, and formerly of the National Physical Laboratory

dental to the races. The machine can therefore justly be regarded as purely an amateur effort, and as such is, it will be agreed, very creditable indeed.

In the design of the Powell light 'plane the biplane type of wings was probably chosen for lightness and compactness. The wing structure is of orthodox design aerodynamically, but considerable scheming must have been required to get the wing fittings for the streamline wires buried inside the wings, since with the thin section used (R.A.F. 15) the rear spar had



THE POWELL LIGHT 'PLANE: Three-quarter front view. Note the neat cowling around the Bristol "Cherub" engine. The fuselage is covered with ply-wood.

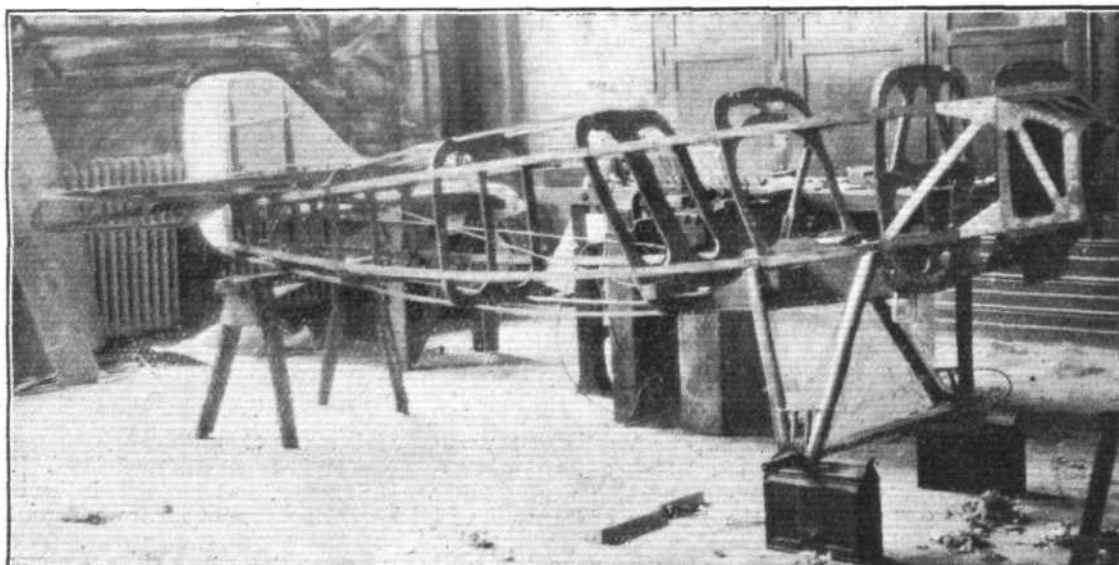
at Teddington. All the design work was carried out by Prof. Powell, and the machine was built by him, with the assistance of Mr. P. Altman and the occasional help of others.

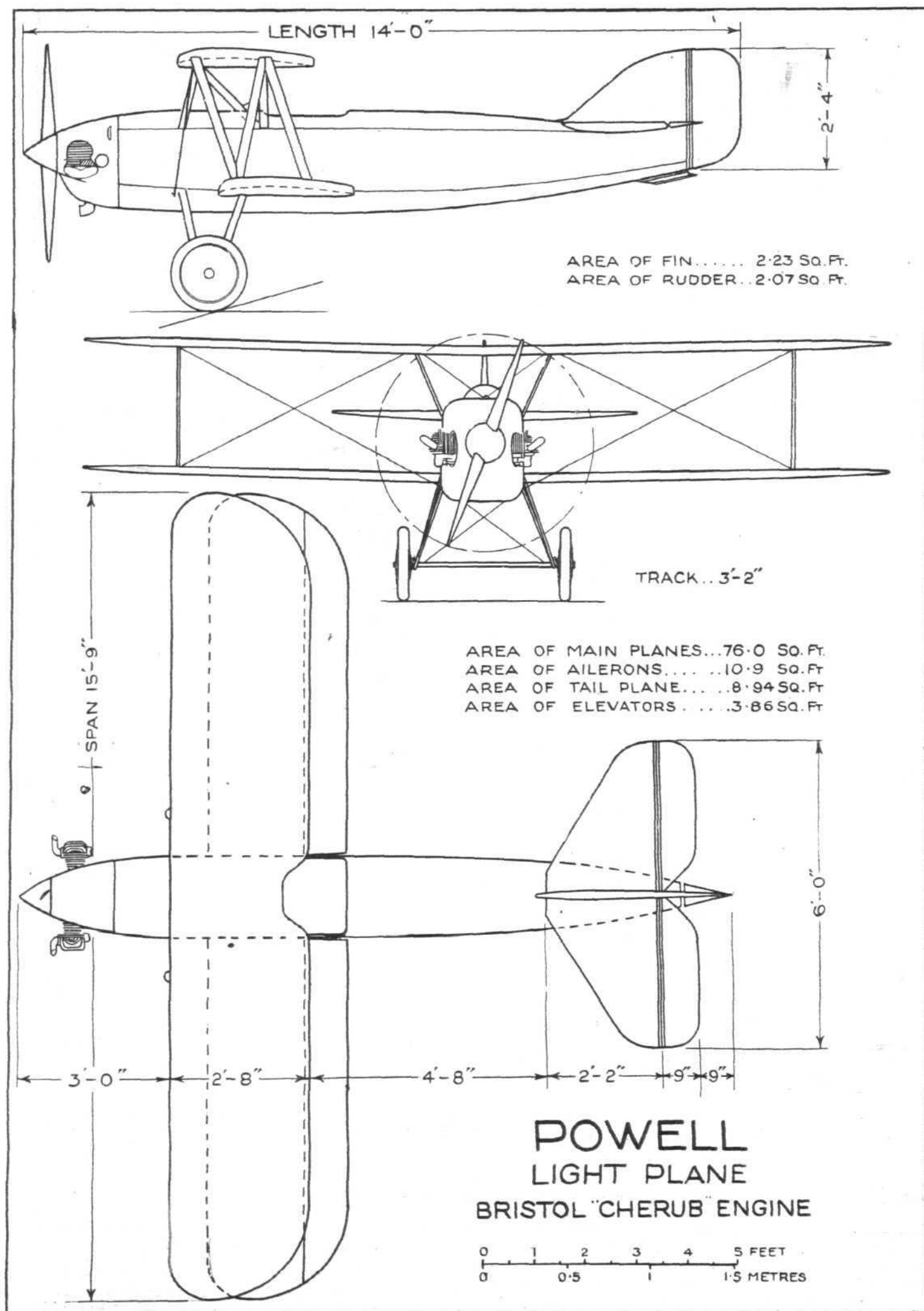
Prof. Powell has been good enough to send to *FLIGHT* a set of blue prints and photographs of his interesting machine, and certain technical data upon which the following description is based. Prof. Powell states that the machine was designed "to win at all costs, which it did at considerable cost," and it may be mentioned that Prof. Powell himself bore the cost of construction and materials, as well as all the expenses inci-

a depth of but 1½ in. These fittings are in the form of forked plates or stirrups, the supports for which are so arranged as to allow the wire to swing in all directions, thus ensuring a direct pull without bending at the threads. The top plane is built in one piece, the dihedral being built in, as it were. Owing to the short span (15 ft. 9 in.) it was possible to build the spars in one piece without splicing.

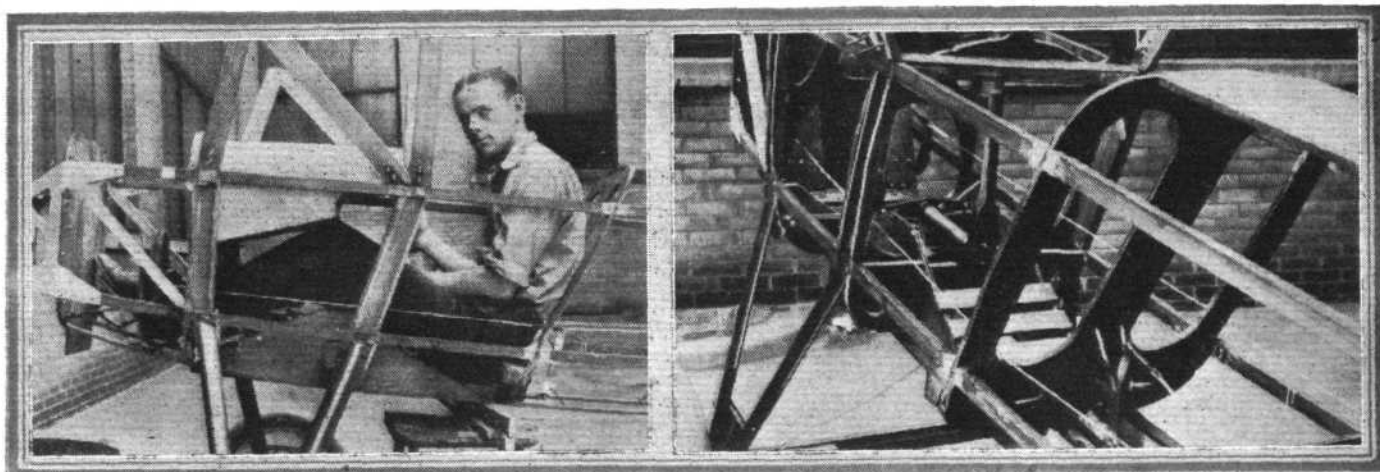
The fuselage is a ply-wood covered *monocoque* structure, built on ¾-in. ply-wood formers. The three-ply covering itself is rather thick (¾ in.), and Prof. Powell states that, although a good deal of weight could have been saved by the use of

♦ ♦ ♦ ♦ ♦
♦
♦
♦ The Powell Light
♦ 'Plane: View of
♦ the skeleton
♦ framework of the
♦ fuselage. The
♦ undercarriage
♦ V's are made of
♦ streamline steel
♦ tubes.
♦ ♦ ♦ ♦ ♦





THE POWELL LIGHT 'PLANE : General arrangement drawings, to scale.



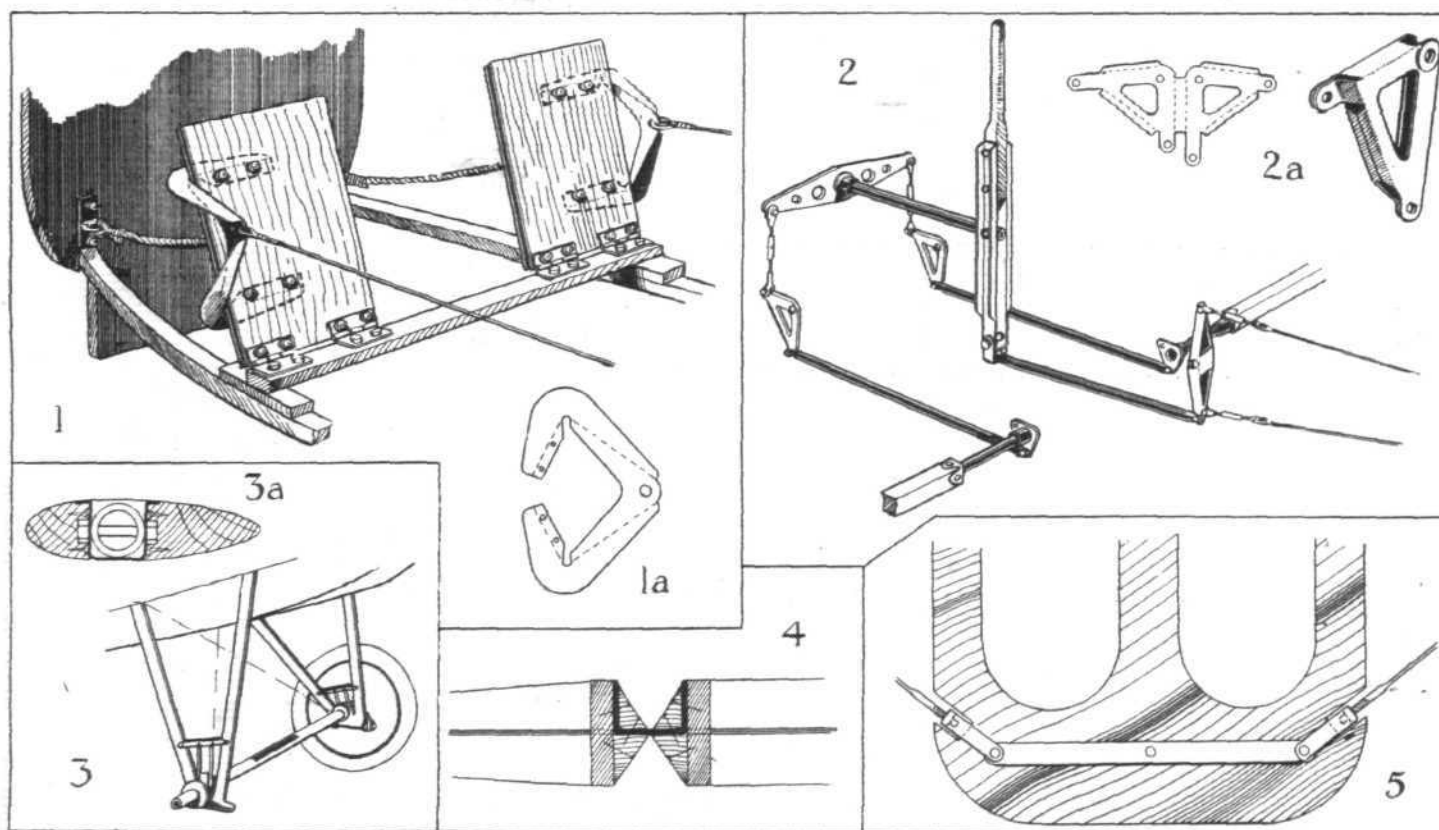
THE POWELL LIGHT 'PLANE : On the left the front portion of the fuselage. The man in the cockpit gives a good idea of the small size of the machine. On the right another view of the pilot's cockpit, showing controls, undercarriage struts, bulkheads, etc.

thinner ply-wood for the covering, the construction is very robust. The fuselage has been designed with a view to reducing head resistance to a minimum, this being important because the pilot's body is the largest single item and the comparatively large fuselage area forming a considerable proportion of the total resistance. In other words, Prof. Powell was restricted, by the size of his pilot, in the reduction of S , and consequently did all he could to reduce K in the fundamental formula $R = KSV^2$, of which British designers were reminded by Mr. Fairey recently. The fuselage certainly appears to be of good shape, and the machine is altogether curiously reminiscent of the Curtiss racers, although the "hump" in the nose is below instead of on top.

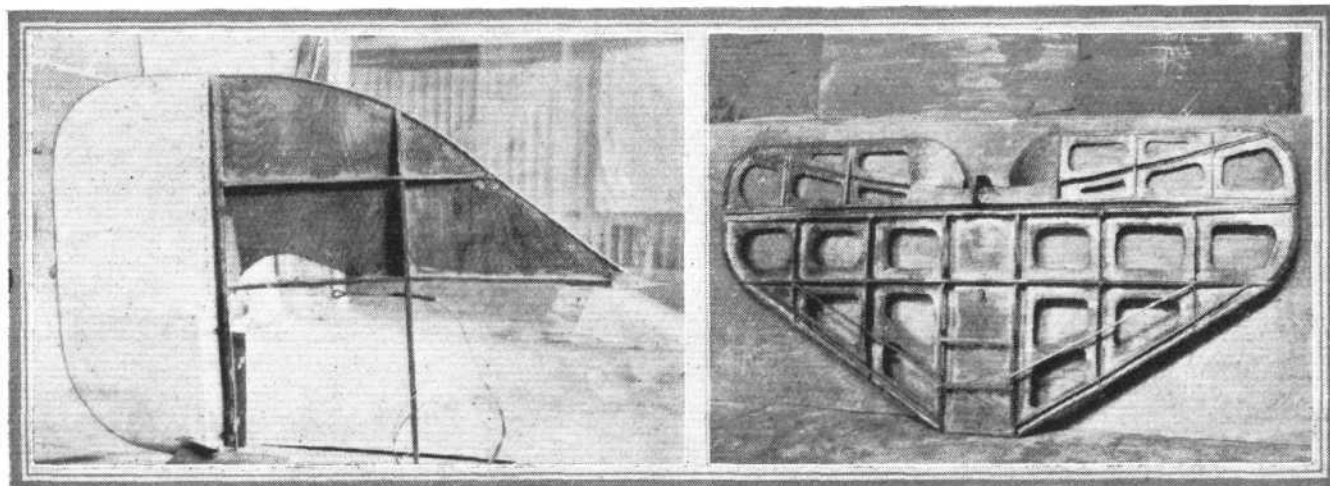
In the construction of the fuselage use was made of jigs for the support of the formers or bulkheads while the covering was put on. Prof. Powell states that, although the making of the jigs took considerable time, they well repaid the work subsequently. A jig was also used in building up the undercarriage, in the construction of which welding was employed.

One of the problems encountered was the seating accommodation for the pilot. The seat had to be about two inches from the bottom of the floor, and three push rods in the control unit had to pass under it and still have clearance for working. Two of the accompanying photographs show this part of the fuselage while still in the skeleton stage, and it will be seen that little space is wasted. The controls are shown in a diagrammatic perspective sketch, and are of somewhat unusual form. Ailerons are fitted to the bottom plane only, and are operated by torque tubes as shown. The rudder is operated by pedals in place of the more usual rudder bar, partly in order to get a more delicate rudder control, and probably also because of the narrow width available in the forward portion of the fuselage. Many of the metal fittings are of the sheet steel type, this having been chosen because all the welding work had to be sent out, and it was therefore desired to keep this down to a minimum.

The Bristol "Cherub" engine is mounted on a steel plate mounting in the shape of a truncated pyramid. This mounting



THE POWELL LIGHT 'PLANE : Some constructional features. 1. The rudder pedals which take the place of the more usual foot bar. 1a shows the sheet metal footguards to which the rudder control wires are attached. 2 is a diagrammatic perspective sketch of the elevator and aileron controls, while 2a shows, in the flat and after bending, one of the bell cranks of the aileron control. In 3 and 3a are shown the undercarriage with divided axle. The cross-member is in the form of a channel or trough-section metal strut in which the axles are housed, and which is streamlined with wood fairings. 4 shows the leather hinge used in elevator and rudder, while 5 is a bulkhead with lift wire attachments.



THE POWELL LIGHT 'PLANE : Three-ply wood enters largely into the construction of the tail.

may be seen in the photograph of the fuselage in skeleton. Professor Powell states that the mounting is rather heavy, but that this was considered necessary in order to guard against the torque-reaction of the two-cylinder opposed engine. Apart from torque variation, he states, the engine is almost perfectly balanced, and at 3,200 r.p.m. runs very smoothly. A petrol tank of 8 gallons capacity is normally fitted under the deck fairing, but for the New York races a small tank, of $2\frac{1}{2}$ gallons capacity, was fitted and actually made on the field.

The undercarriage is of normal V-type, built up of streamline steel tubes, welding being employed for joining at the angle of the struts. The axle is of the divided type, the two short halves resting in a metal trough or channel running across from side to side. This channel is streamlined with wood fairings, and an unusual feature is that the usual wires from the axle hinges to the fuselage are absent, the strength of the trough being sufficient to withstand bending without the aid of bracing.

Three-ply wood enters largely into the construction of the tail surfaces, and a very unusual feature is formed by the leather hinges employed for the rudder and elevator. These hinges are in the form of continuous strips of leather, arranged as shown in section in Fig. 4 of our set of sketches. For the rest the Powell light 'plane is of normal construction, and the

only other feature to which attention should be called is the almost ridiculously small size of the machine. The photograph and scale drawings do not really convey an impression of the size, any more than will, to the average person, the statement that the span is but 15 ft. 9 in. and the length 15 ft. What these dimensions actually mean is that the machine could stand comfortably in a fairly small living room, and that thus the question of garaging is a simple one. The wing area is but 76 sq. ft. including ailerons, or roughly half of the average area of the Lypne single-seaters of 1923. Thus, the Powell light 'plane is certainly one of the smallest practical aeroplanes hitherto produced.

The dimensions and areas of the Powell light 'plane are shown on the general arrangement drawings. Following are the figures for weight, etc.: Weight of machine empty, 310 lbs.; fuel and oil ($2\frac{1}{2}$ gallons), 15 lbs.; crew, 150 lbs.; total loaded weight, 475 lbs. Fuel capacity (small tank), $2\frac{1}{2}$ gallons; large tank, 8 gallons, endurance (large tank), 6 hours; range (large tank), 400 miles. Wing loading, 6.2 lbs./sq. ft.; power loading, 15.8 lbs./h.p. (on 30 b.h.p.). Top speed, 85 m.p.h. Landing speed, 50 m.p.h. Climb to 5,000 ft. in 17 minutes, to 10,000 ft. in 45 minutes. Ceiling, 15,000 ft. These figures, it should be pointed out, relate to the machine as fitted with the small tank.

Hendon Aerodrome Bought by the Government

THE prolonged dispute between the Treasury and Mr. Claude Grahame White in respect to Hendon aerodrome has at last come to an end, and the "historic" London aerodrome, Hendon, of pleasant pre-war memories, has become Government property, and is to be used by the R.A.F. as the headquarters of home defence units. The agreement for purchase has already been signed, but the question of purchase price is still, it seems, somewhat involved—there being sundry claims and counter-claims on both sides to be considered—but the figures involved may be stated, roughly, to be between £600,000 to £800,000. The area taken over is about 350 acres in extent, and includes the London Country Club, with its golf course, which extends south of the aerodrome itself as far as the new "Tube" railway. We hope to publish further details of the transaction on another occasion.

Fecundity

So quietly has it happened, and with so little fuss made about it, that it comes as somewhat of a surprise to learn that the de Havilland "Moth" family now numbers no less than 29 "brothers." It had been realised, of course, that the British light 'plane clubs had taken a certain number, that de Havillands themselves had in use a few, and that one or two had been sold to private owners. But that the family had grown to nearly 30 already had probably been realised by very few. Nevertheless this is the case, 29 machines of this type having been either actually completed or being on order. It is not without interest to state briefly where these 29 have gone. To begin with, the light 'plane clubs absorbed nine, to which was added the machine promised by Sir Charles Wakefield to the Lancashire Club. The Australian light 'plane clubs have accounted for another six, while two have gone to the Royal Australian Air Force and one to the Controller of Civil Aviation in Australia (Col.

Brinsmead), making a total of nine for Australia. At the de Havilland Flying School at Stag Lane five "Moths" are in use, partly at the private school and partly for use by the reserve school. Three "Moths" have been sold to private owners in Great Britain, one to Mr. Kittel, of the London Aeroplane Club, one to Wing Commander Wynn, and one to Mr. G. B. H. Mundy. The fame of the "Moths" is spreading, for one has been sold to Chile, and finally—perhaps the greatest compliment of all in view of the fact that the "Moth" is not officially a light 'plane—the British Air Ministry have purchased an entire machine. Yes, it is quite true, a whole "Moth."

The Schoolboys' Exhibition and Aviation

FURTHER to our report last week in reference to the Air Ministry's exhibit at the Schoolboys' Exhibition which opens on Saturday at the Royal Horticultural Hall, we now learn that the De Havilland Co. will also be exhibiting a "Moth," and are giving a first prize (for an essay) of one hour's instruction, or a flight of 100 miles, on a "Moth," and a number of subsidiary prizes of "flips." Truly, the right way to create interest in aviation matters so far as the schoolboy is concerned.

German Air Traffic Suspended

OWING to the amalgamation of the air traffic companies throughout Germany, all German air services have been temporarily suspended pending the re-organisation of the various air services as a whole. At present the only service in operation in Germany is the Imperial Airways London-Cologne service—and it remains to be seen whether or not Germany will grant a continuance of this service when Cologne is evacuated. The new German air company—as yet unnamed—is supposed to come into being on January 1, and it is hoped that the process of re-organisation will be sufficiently completed to resume air traffic, over the re-arranged routes, about March.

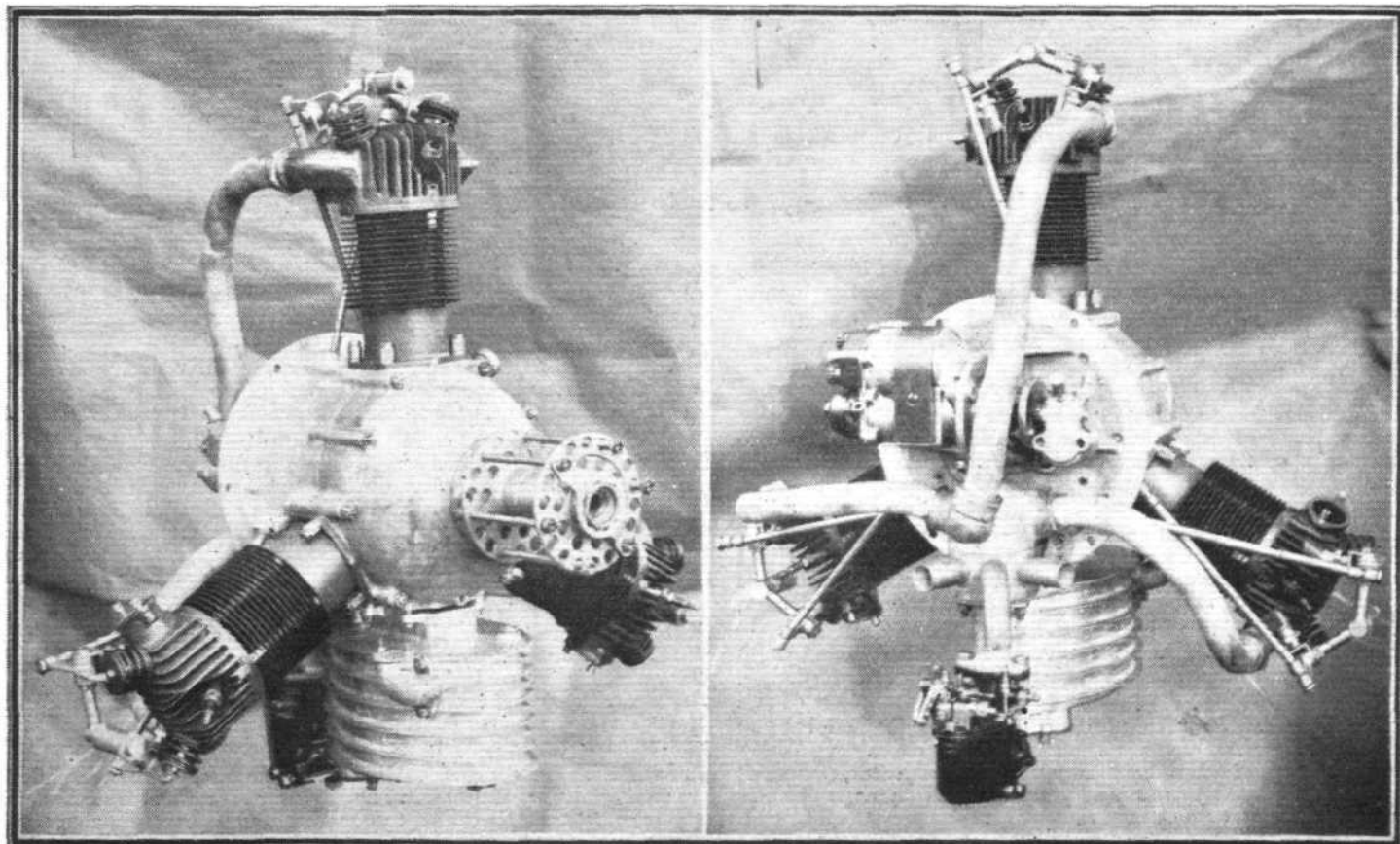
THE BLACKBURNE "THRUSH" LIGHT 'PLANE ENGINE

First to Pass Air Ministry 100 Hours' Type Tests

As briefly recorded in last week's issue of *FLIGHT*, the new 1,500 c.c. light 'plane engine produced by Burney and Blackburne, of Bookham, Surrey, passed its Air Ministry 100 hours' type tests a short time ago with flying colours. As far as we are aware, this is the first light 'plane engine to pass this test, which is of a very severe nature, and the makers of the "Thrush," as the new 1,500 c.c. Blackburne is called, may well be proud of this distinction. We recently paid a visit to the Bookham works of Burney and Black-

burne, where the actual type test engine was examined, and the parts must be admitted to be in excellent condition, considering that the engine ran 108 hours on the test and had previously been running for over 30 hours, so that in all it has close upon 140 hours' running before being stripped down. The power developed at the end of the official tests was slightly greater than before the commencement of the tests, and the series of ten-hour runs were accomplished without any adjustments during runs being required. Only two adjustments after runs were needed, these being to tappets. Otherwise the engine ran without trouble of any kind whatever, and the important parts showed but little sign of wear.

Reduction of weight to a minimum has not been attempted in the "Thrush," which in point of fact weighs 3.77 lbs./b.h.p.,



THE BLACKBURNE "THRUSH" LIGHT 'PLANE ENGINE: These front and rear views of the new 1,500 c.c. engine show it to be similar to the 1924 type, except for the increased capacity, but great improvement in reliability has been effected, and the "Thrush" has now passed the Air Ministry 100 hours' type tests.

burne, where the actual type test engine was examined, and the parts must be admitted to be in excellent condition, considering that the engine ran 108 hours on the test and had previously been running for over 30 hours, so that in all it has close upon 140 hours' running before being stripped down. The power developed at the end of the official tests was slightly greater than before the commencement of the tests, and the series of ten-hour runs were accomplished without any adjustments during runs being required. Only two adjustments after runs were needed, these being to tappets. Otherwise the engine ran without trouble of any kind whatever, and the important parts showed but little sign of wear.

Space does not permit of giving a detailed description of the Blackburne "Thrush" this week, but the two views published herewith give a good idea of the general layout of the engine, which is of the three-cylinder radial type. In the main the engine is similar to the 1924 model except for the increase in capacity to 1,500 c.c., but great improve-

ments have been effected in the quality of various highly-stressed parts, chiefly by the use of better material, and the result is seen in the ability of the engine to pass the very severe 100 hours' type tests. The detail design is very simple indeed, and, provided the present standard in quality of materials and workmanship is maintained, the "Thrush" should prove a very reliable power unit for light 'planes.

Next week we hope to publish a detailed description of the engine, with power curve, installation diagram, etc. In the meantime a few figures may be of interest.

The weight of the "Thrush," inclusive of propeller hub, oil sump, induction and exhaust pipes, carburettor, magneto and impulse starter, is 132 lb. The petrol consumption is 0.54 to 0.52 pts./h.p./hour, and the oil consumption 0.03 pt./h.p./hour. The normal speed of the engine is 2,500 r.p.m., at which the power developed is 35 h.p. This is the normal power of the engine, at which it can safely be run for prolonged periods. The maximum permissible speed is 2,750 r.p.m., at which speed the engine develops a maximum power of 38 b.h.p. The type tests were, of course, run under the usual conditions of 90 per cent. full power, etc.

PERSONALS

Married.

Flying-Officer PATRICK JOHN BETT, R.A.F., late the Gordon Highlanders, eldest son of Mr. and Mrs. David Gordon Bett, of Hasketon, Woodbridge, Suffolk, was married on December 17, at St. Mary's Church, Godmanchester to Miss ELLEN GERALDINE TOWGOOD, only daughter of Mr. and Mrs. Robert L. Towgood, of Farm Hall, Godmanchester, Huntingdon.

On December 15, at St. Mary Abbot's, Kensington, Flight-Lieutenant D. T. LYDFORD, A.F.C., R.A.F., was married to ISABEL BROUGHTON-SMART, niece of Miss Susan Smart, 20, Holland Street, Kensington, W.8.

At Minstead (Hampshire) Parish Church on December 19,

Squadron-Leader WILLIAM ALEC CORYTON, M.V.O., D.F.C., son of the late Mr. William Coryton, D.L., J.P., of Pentillie Castle, Cornwall, was married to Miss PHILIPPA DOROTHEA HANBURY, daughter of Mr. and Mrs. Daniel Hanbury, of Castle Malwood, New Forest. Flight-Lieutenant E. B. Playford was best man.

To be Married

A marriage has been arranged, and will take place during January, in Paris, between Mr. ROWLAND W. CASH (late Captain, Sherwood Foresters and Royal Air Force), eldest son of Mr. J. Theodore Cash, F.R.S., of Hereford, and Mrs. FRANCIS DIXON, of Paris.

IMPERIAL AIRWAYS, LIMITED

THE first Ordinary General Meeting of Imperial Airways, Ltd., was held on December 29, the Rt. Hon. Sir Eric Geddes, G.C.B., G.B.E. (Chairman of the Company) presiding. In his opening remarks Sir Eric reviewed the circumstances prevailing at the time of the formation of the company, and the work which had since been done. He emphasised the fact that four organisations had to be welded into an efficient single organisation; repair shops and stores were centralised, the additional expense being considerable until the concentration was accomplished; new maintenance and overhaul schedules had to be prepared and the combined staffs instructed in the new system and improved; in fact, their first year's work could not be regarded otherwise than as the experimental period in the history of the company. The year also started with regrettable and serious labour troubles, which had very adverse effects on operations. Nevertheless, during this first year they obtained data which would enable them to pursue a prudently progressive policy.

Turning to the balance-sheet, on the assets side aircraft and engines were shown at cost, as fleet of aeroplanes, their engines and spare engines had to be maintained at the highest efficiency and could not be allowed to depreciate. The only provision necessary was for obsolescence, for which a reserve of £22,998 1s. 3d. was made. Ample provision for depreciation had been made in respect of premises, plant, tools, etc., the plant including the most modern equipment for testing engines under even more stringent conditions than if a flight test were made. This equipment would be extended to carry out the same kind of tests for air-cooled engines which were being installed in some of the modern aeroplanes under construction for the company. It was expected that this type of engine would produce economies in maintenance costs.

Stores and spare parts had been valued at or under cost. Sundry debtors appeared high, owing to an instalment of subsidy falling due after the close of the year, and the small reserve made for doubtful debts had proved unnecessary.

The liquid cash position was good, and cash and investments totalled £155,781 12s. (equal to 4s. 5½d. per 10s. of paid-up share capital). Thus, the sundry debtors would more than have paid the creditors and sundry outstandings, and from this they might seek some measure of reassurance.

The trading and profit and loss accounts were affected mainly by three items, maintenance and overhauls, obsolescence, and insurance. Ordinary depreciation and maintenance had cost over £63,000. Of this figure no less than £61,712 4s. 11d. represented the cost of maintenance and overhauls. It seemed a high price to pay for maintenance, but not if they put safety and reliability first.

The problem of maintenance was receiving very earnest attention, and whilst safety would be maintained, the costs would have to be brought down. It was satisfactory to know, said Sir Eric, that they were operating as economically as any other civil aviation undertaking, as was confirmed by Sir Samuel Hoare.

The solution of these high costs of maintenance lay in simplification and standardisation of designs, in the use of metal alloys for aeroplane components hitherto made of wood, in research into the causes of fatigue in metal parts of aeroplanes and particularly engines, and in an increase in the paying load capacity per horse-power employed, so that the greater potential earning power of the aeroplane would compensate for the necessarily high costs of inspection, maintenance, and overhauls.

Referring to the question of obsolescence, which was mainly a question of policy, Sir Eric referred to the fact that when the company was formed there were no aeroplanes which could be flown profitably on regular services unless every mile flown was subsidised, although certain types approached the profitable stage. During the past 18 months new aeroplanes had been designed which, owing chiefly to their increased carrying capacity, were really capable of commercial development—they had the advantage of a greater margin of safety in that they had greater power and had two or three engines. On the grounds of safety and progress the board adopted the policy of replacing as early as possible with these modern aeroplanes certain other aeroplanes which were not capable of development, although they had not depreciated in the ordinary commercial sense of the word.

Regarding aviation insurance, this was high during the year owing to the limited amount of business. Economies had been made under this heading, and the rates for later types of aeroplanes were lower.

Bearing in mind that flying was carried out during only

ten months of the year, the traffic carried showed a steady growth. The London-Paris service carried the greatest traffic and was maintained throughout the year.

The London-Ostende-Brussels-Cologne service was well patronised and was duplicated throughout the summer. The London to Berlin service, via Amsterdam and Hanover, was started in June, and connected at Amsterdam with air lines to Scandinavia and certain principal towns in Germany. Over 825,000 miles were flown, 11,000 passengers and 600 tons of goods and mail were carried on these routes.

Turning to the subject of advantageous routes and how to attract increased traffic, Sir Eric pointed out that regularity and reliability were the first considerations. These he expected to increase when the new types of machines came into service. The worst conditions under which to attract traffic were in competition with highly developed express train services, and the best conditions were over long distances with less highly developed competition from land or sea services. Lighted air routes, and appliances for flying and landing in foggy weather, would greatly advance commercial flying.

As regards future development, Sir Eric called attention to the advantages of long routes, and said that the very name of the company implied that they would not be justified in confining operations to short European routes. Acting with this object in view, they had looked farther afield, and an agreement had now been made with the Air Ministry for the company to maintain an air service between Egypt and India, the termini being at or near Cairo and at Karachi, in India. The distance was approximately 2,500 miles, and the saving of time would be measured in days, not hours. India would be brought nearer to England by five days, with a possible saving of ten days in the time taken by a return letter. When the route was equipped for night flying, the saving of time would be increased.

Aeroplanes and engines must be designed and built, hangars erected, and ground organisations provided, and an air line of this size could not be commenced without months of preparation, but they confidently hoped that the first aeroplane would leave Cairo for India not later than January 1, 1927.

The agreement with the Air Ministry under which the company would receive an annual subsidy of £93,600, was for five years, and the Government was to provide aerodromes, hangars, and other accommodation. The service was to be run with three-engined machines capable of maintaining their requisite height in flying on any two engines, thus materially increasing the reliability of the service.

The route had been surveyed and the estimates had been most carefully checked on the spot, and it was believed that with this subsidy and other assistance the service could be run profitably as a part of the whole organisation.

They must build prudently and cautiously in these matters. At present they flew regularly to Basle and Zurich, and, looking to the future and proceeding step by step with caution, they hoped that a fast connection, mainly by air, between Basle and Cairo, might be possible, thus enormously increasing the saving of time between London and Karachi.

If on this Cairo-Karachi venture they could prove reliability and punctuality, the possibilities opening for civil aviation would be great, and extension to Bombay and Calcutta would be justified, based on saving of time alone. In years to come they might fly regularly to Rangoon, Singapore, and even beyond.

Concerning the new subsidy basis, Sir Eric said that the position might be summarized by saying that, though the company could have performed its strict obligation and earned its subsidy by flying small machines for the million miles per annum, this would not have served the national purposes for which the subsidy was granted. The small aeroplanes were not capable of great development for transport services, but looking at the position from a purely financial view, the company would not have been justified in using the larger aeroplanes, although these were the type most suitable.

The modification in the agreement to which reference had been made encouraged the use of a truly economical aeroplane unit, as opposed to the aeroplane which was merely cheap to fly.

In conclusion, Sir Eric Geddes paid a tribute to the staff, notably to the pilots of Imperial Airways. They did not start very happily, but he was glad to say that the present relationship between the staff and the management was good.

The retiring director, Sir Samuel Instone, was unanimously re-elected.

THE ROYAL AIR FORCE

London Gazette, December 22, 1925

General Duties Branch

The following Pilot Officers are promoted to rank of Flying Officer:—F. H. S. David, M. W. Goldie, H. M. G. Parker; Nov. 15. C. Feather, H. S. Martin; Dec. 15.

Flying Officer J. C. Hill relinquishes his short service commn. on account of ill-health; Dec. 23. Pilot Officer G. A. Whitehead is dismissed the service by sentence of General Court Martial; December 10.

Stores Branch

Squadron Leader C. Mason is placed on the retired list; Dec. 20.

Medical Branch

Flight-Lieut. G. Kinneir is transferred to Reserve, Class D.2; Dec. 19.

Reserve of Air Force Officers

H. R. Raikes, A.F.C., is granted a commn. in Class B, General Duties Branch, as a Squadron Leader; Oct. 11. R. A. Kendrick is granted a commn. in Class AA, General Duties Branch, as a Pilot Officer on probation; Dec. 7. P. A. Carrie, M.B., Ch.B., is granted a commn. in Class DD as a Flying Officer; Dec. 22.

The following are confirmed in rank:—Flying Officer A. T. Daw; Nov. 7. Pilot Officer C. H. E. Coles; Dec. 16. The following are transf'd. from Class A to Class C:—Flight-Lieut. B. A. Trechmann; Dec. 19. Flying Officer K. W. Brewster, M.C.; Dec. 20.

Memorandum

Sec. Lieut. A. Evans relinquishes his honorary commission on enlistment in the Supplementary Reserve, Army; Nov. 24.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Squadron Leader T. V. Lister, to H.Q., India; 15.12.25.
Flight Lieutenants: C. L. King, M.C., D.F.C., to Station Commandant, Hinaidi; 15.12.25. W. E. Reason, to Cairo-Cape Flight; 3.12.25. P. S. Jackson-Taylor, to R.A.F. Depot; 18.12.25. R. Joze-Slade, D.S.C., to No. 24 Sqdn., Kenley; 21.12.25. W. T. S. Williams, D.S.C., to Sch. of Tech. Training (Men), Manston; 30.12.25.

Flying Officers: C. F. H. Grace, to No. 5 Flying Training Sch., Sealand; 16.12.25. C. Walter, to No. 19 Sqdn., Duxford; 16.12.25. F. F. Wilkinson, to Central Flying Sch., Upavon; 16.12.25. G. A. F. Bucknall and C. V. Lock, to No. 1 Sqdn., Iraq; 15.12.25. R. Duncanson, to No. 208 Sqdn., Egypt; 28.11.25. (Hon. F/L.) R. F. Carter, to H.Q., Inland Area; 2.11.25. A. L. R. Duke, to No. 30 Sqdn., Iraq; 15.12.25. A. W. Rowbotham, to No. 84 Sqdn., Iraq; 15.12.25. A. F. Scroggs, to Electrical and Wireless Sch., Flowerdown; 1.1.26.

Pilot Officers: A. L. Ottway and D. A. Boyle, to No. 1 Sqdn., Iraq; 15.12.25.

W. T. Holmes and P. H. Nicholls, to Aircraft Depot, India; 15.12.25. R. E. Costa, to No. 7 Sqdn., Bircham Newton, on appointment to a permanent commn. from Cadet College; 29.10.25. C. J. Pavia, to No. 5 Flying Training Sch., Sealand; 2.1.26.

Stores Branch

Flying Officer C. T. Davis, to No. 56 Sqdn., Biggin Hill, on transfer to Home Estab.; 31.12.25.

Accountant Branch

Flying Officer C. W. Cackett, to R.A.F. British Hospital, Iraq; 15.12.25.

Medical Branch

Squadron Leaders: P. T. Rutherford, O.B.E., to H.Q., Iraq; 28.11.25. T. J. Kelly, M.C., M.B., B.A., to No. 6 Group H.Q., Kenley; 30.12.25.
Flight Lieutenants (Dental): D. H. W. Williamson, to H.Q., Cranwell; 7.1.26. A. Williams, to Station H.Q., Northolt; 5.1.26.
Flying Officers: E. A. Aslett, to R.A.F. Hospital, Halton; 28.12.25. H. M. Levy, to R.A.F. Depot; 28.12.25.

IN PARLIAMENT

R.A.F. Estimates

SIR F. SYKES, on December 21, asked the Secretary of State for Air (1) whether, in accordance with War Office practice, he will arrange for publication in future Air Estimates of details of officers borne on staff establishments; and whether he will include in such publication details of classification of duties under flying, engineering, and non-technical ground duties;

(2) whether, in accordance with War Office practice, he will arrange for publication in future Air Estimates of details of personnel establishment of units; and whether he will include in such publication details of classification of duties under flight, technical and non-technical ground duties?

SIR S. HOARE: The number of officers borne on all staff and unit establishments of the Royal Air Force can be ascertained by reference to the monthly Air Force list, which also contains a considerable amount of information as to the distribution of duties. The classification of duties suggested by my hon. and gallant friend does not correspond to the basis on which the duties are in fact allocated. Royal Air Force establishments depend on many varying factors, such as nature of work, types of aircraft, and geographical situation. It is consequently impossible to classify them under a limited number of heads; moreover, apart from their multiplicity, frequent revisions are necessary. They are, therefore, not at all suitable for publication in annual Estimates. For these and other reasons I am afraid that the adoption of his suggestions is not practicable.

Vessels

SIR F. SYKES asked the Secretary of State for Air if he will state the numbers of power-driven marine surface craft carried on the establishment of the Royal Air Force for employment in conjunction with air operations other than transport; to what extent naval staff and facilities are employed on their current and special maintenance; whether they are commanded and manned by acting, attached, seconded, or ex-naval personnel; and, if the latter, what arrangements exist for maintaining supply of personnel with recent naval experience?

SIR S. HOARE: In answer to the first part of the question, the only power-driven surface craft carried on the establishment of the Royal Air Force for employment in conjunction with air operations other than transport are three vessels which were taken over from the War Office for police and defence work on the rivers in Iraq; in answer to the second part, these vessels are maintained at Basrah dockyard, where no naval maintenance facilities are available, principally by Indian and local native labour assisted by Air Force personnel; in answer to the third part, they are commanded by officers with suitable experience, the remaining dock and engine room complement consisting of natives recruited locally or in India, while the gun crews are Air Force personnel who have been trained at Whale Island. As regards the last part of the question, no difficulty is anticipated in maintaining suitable personnel with adequate knowledge for handling these river craft.

Air Cadetships

THE following are declared by the Civil Service Commissioners to be the successful candidates at the competition held last month for admission to the Royal Air Force Cadet College, Cranwell, but their admission is conditional on their having passed a medical examination. The names are in order of merit. A Table of Marks will be sent to each candidate as soon as possible:—Jones, E. A.; Beddall, R. S.; Pickles, K. F. T.; Bayley, C. C. A.; Waghorn, D. J.; Dewar, J. S.; Willis, R. A. T.; Sorby, J. E. H.; Vaughan, E. A. O'S.; Leech, H. H.; Parker, H. C.; Dillon-Trenchard, J. H. L.; Norris, N. B.; Beamish, C. E. St. J.; Davis, R. O. W. M.; White, N. E.; Brooke, K. R.; Hutton, W. H.; Blunt, S. L.; Chalmers, P. J. B.; Stevens, F. J.; Carter, J. S.

R.A.F. Flying Accident

THE Air Ministry regrets to announce that as a result of an accident near Nefisha, Egypt, to a D.H.9A of No. 4 Flying Training School, Abu Sueir, on December 23, Pilot Officer Cecil William Woodbyrne, the pilot of the aircraft, and No. 328867 A.C.1 Arthur Thomas Groom, were seriously injured. Pilot Officer Woodbyrne died later in the day.

R.A.F. Boxing

THE first series (both divisions) of the Royal Air Force Team Championships (Boxing) have been completed. In the "A" Division Henlow beat Halton at Halton, and Flowerdown beat Netheravon at Netheravon. In the next round the Electrical and Wireless School will meet the

Inland Area Aircraft Depot, at Flowerdown, and Manston Station will meet R.A.F. Depot at Manston. In the "B" Division Digby beat Spittlegate (Grantham) at Spittlegate; Central Flying School beat the School of Army Co-operation at Old Sarum, and Duxford (holders) beat Bircham Newton at Bircham. The draw for the next round of this division is: Central Flying School v. R.A.F. Base, Calshot, at Calshot; No. 5 Flying Training School v. M.T. Repairs Depot, at Chester; Duxford Station v. No. 2 Flying Training School, at Duxford; and Martlesham Heath v. Gunnery School, Eastchurch, at Martlesham. All the above matches are to be decided between the beginning of the New Year and January 23.

Aeronautical Additions at South Kensington

SOME additions have been made to the aeronautical exhibits in the Science Museum, South Kensington. These include a series of models of historic flying machines, which has been lent by the Air Ministry, among which may be mentioned the lighter-than-air flying boat invented by the Jesuit priest Francisco Lana in 1670, Sir George Cayley's "Aerial Carriage" of 1843 (a combined helicopter and aeroplane), and Lennox's "Eagle Airship" of 1835.

London-Brussels in 85 Minutes

ON December 24 one of the Imperial Airways Napier-D.H. machines covered the 200 miles between London and Brussels in 85 minutes, or at an average speed of 141 m.p.h.

AIR POST STAMPS

By DOUGLAS B. ARMSTRONG

In the annals of the Air Post the year 1925 was in many ways a memorable one. Not only was it marked by considerable extension of air mail systems throughout the world, but important survey flights were successfully carried out over a number of prospective air mail routes that are ripe for development. Incidentally the longest direct air post line was opened up between Toulouse and Dakar (French West Africa). Air post collectors may find cause for gratification in the existence of special stamps, cachets or vignettes that are directly associated with these epoch-making postal flights.

Some Famous Flights.

ONE of the most notable flights of the year was that effected by the Latocoere Company from Rio de Janeiro to Buenos Aires, and return on January 13-25, 1925. The limited number of letters flown on this occasion were enclosed in souvenir envelopes adorned with representations of the national flags of Brazil and the Argentine. Special cachets were also applied at either end, postage being prepaid in the ordinary postage stamps of the two countries.

Etiquettes bearing portraits of the aviators and a map of the route were affixed. In addition to the special cachets struck upon about three hundred letters carried by Captains Lemaitre and Arrachard on their record flight from Paris to Dakar on February 3-5, 1925, but a small mail consigned by the ill-fated aeroplane "Roland Garros" which set out to fly from Paris to Lake Echad on January 18, 1925, failed to reach its destination owing to an accident which caused the flight to be abandoned when Niamey on the Niger had been reached. The special envelopes prepared for this flight bore a picture of the machine.

Letters and cards were conveyed (unofficially) upon various sections of Mr. Alan Cobham's remarkable flight from London to Rangoon, in the latter stages of which a violet cachet was employed.

On March 2, 1925, an official air mail service was put in operation by the Union of South Africa government between Cape Town and Durban in connection with the weekly mail steamers, and distinctive postage stamps were provided for the purpose. Unfortunately the experiment did not meet with sufficient support, the flights being suspended on June 18, following.

Another and striking set of air post stamps showing a polar bear disturbed by the intrusion of an aeroplane upon his icy solitude was specially created by the Norwegian post office to frank some thousands of souvenir cards that accompanied Capt. Amundsen upon his sensational attempt to fly to the North Pole in June of this year.

The U.S. dirigible "Los Angeles" (formerly Z.R.3) made two trips from Lakehurst, N.J., to Bermuda and back carrying mails, and one to Porto Rico all of which are denoted by the special cachets impressed upon the correspondence thus transmitted. Tragic mementoes of the ill-fated airship "Shenandoah," which met with disaster in a tornado on September 2, exist in the form of letters included in a special mail carried by this dirigible to the Conference of Governors held at Poland Springs only a few weeks previously.

Neither stamps nor postmarks of a distinctive character have so far been provided by the Japanese post office in connection with two regular air post lines linking Tokio with Osaka, and Osaka with Fukuoka, which were put in operation in April last. Air mail carried on the first flight over the London-Sweden route on May 15, 1925, was struck with the regulation "Luftpost" cachet on arrival at Malmo.

The Marquis di Pinedo's 34,000 mile flight from Rome to Melbourne and back via Japan is recalled by some Indian postcards bearing a large rectangular cachet inscribed "Italian World Air Flight," together with a green label stating "This letter was carried by the Italian Seaplane World Flight." It is understood that these covers were carried on the stage from Calcutta to Rangoon.

Finally, as already announced in FLIGHT, Mr. Alan Cobham bears with him on his flight from London to Capetown a small mail of official letters and souvenir postcards that will serve to commemorate this notable achievement.

The Year's Air Stamps.

SEVENTEEN countries were jointly responsible for the issue of 86 new varieties of air post stamps in the year 1925. Of these Albania, Alaouites Territory, Bolivia, Denmark, Honduras, Norway, Siam and South Africa had not previously possessed stamps of this character. The remaining new issues emanated from Austria, Ecuador, Esthonia, Grand Lebanon, Hungary, Poland, Switzerland, Syria and Uruguay. All have been described in detail in this column upon various occasions and do not call for further comment.

Semi-Officials.

THE most noteworthy issues of semi-official air post vignettes made during the year were those in connection with the resumed air post service between Hailebury, Ont., and the Ronyn goldfields (Canada), the Italian Philatelic Congress special flight from Leghorn to Rome (June 28) and one prepared for an experimental flight between Naestved and Copenhagen (Denmark) on September 3, 1925.

Air Posts in Juco-Slavia.

SPECIAL stamps are announced for issue in connection with the establishment of a series of air post lines in Juco-Slavia early in the New Year. These routes, five in number, will be developed under the auspices of the Juco-Slavia Aero Club, and will connect Belgrade by air with Agram, Laibach, Sarajevo, Uskub and Monastir. An air line from Cetinje to Podgoriza is likewise projected.

PUBLICATIONS RECEIVED

Official Gazette of the United States Patent Office. October 2, 1925. Vol. 339, No. 4. United States Patent Office, Washington, D.C., U.S.A. Price 10 cents.

Aeronautical Research Committee, Reports and Memoranda: No. 967 (Ae. 183).—An Experimental Study of the Vibrations in the Blades and Shaft of an Airscrew. By A. Fage. September, 1925. H.M. Stationery Office, Kingsway, London, W.C.2. Price 9d. net.

The Canadian Patent Office Record. December 1, 1925. Vol. LIII. No. 48. The Canadian Patent Office, Ottawa, Canada.

Meteorological Office: Air Ministry Professional Notes. No. 42. The Investigation of the Winds in the Upper Air. By J. Durward. M.O. 273b. H.M. Stationery Office, Kingsway, London, W.C. 2. Price 1s. 6d. net.

Meteorological Office, Air Ministry. Report of Advisory Committee on Atmospheric Pollution, Year Ending March 31, 1925. M.O. 280. H.M. Stationery Office, Kingsway, London, W.C. 2. Price 5s. 6d. net.

The Air Pilot Monthly Supplement. No. 14. December, 1925. Air Ministry, Kingsway, London, W.C. 2.

Notiziario Tecnico No. 5. November, 1925. Ministero dell'Aeronautica, Direzione della Rivista Aeronautica, Via Torino, 39, Rome.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1924

Published December 31, 1925

- | | | | |
|---------|---|---|------------|
| 20,435. | H. L. PILLEUX. | Apparatus for navigation in the air. | (221,790.) |
| 20,925. | H. L. PILLEUX. | Apparatus for navigation in the air, etc. | (237,853.) |
| 21,008. | G. H. HARDY. | Screw propellers. | (243,811.) |
| 21,766. | VICKERS, LTD., and J. WARDLE. | Fluid-pressure-operated motors. | (243,835.) |
| 27,603. | F. L. RAPSON. | Tyres and wheels for use on aeroplanes. | (243,890.) |
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